

Mapping the Way Ahead with...

Integrated Master Plan and Schedule (IMP/IMS)

Presented by:

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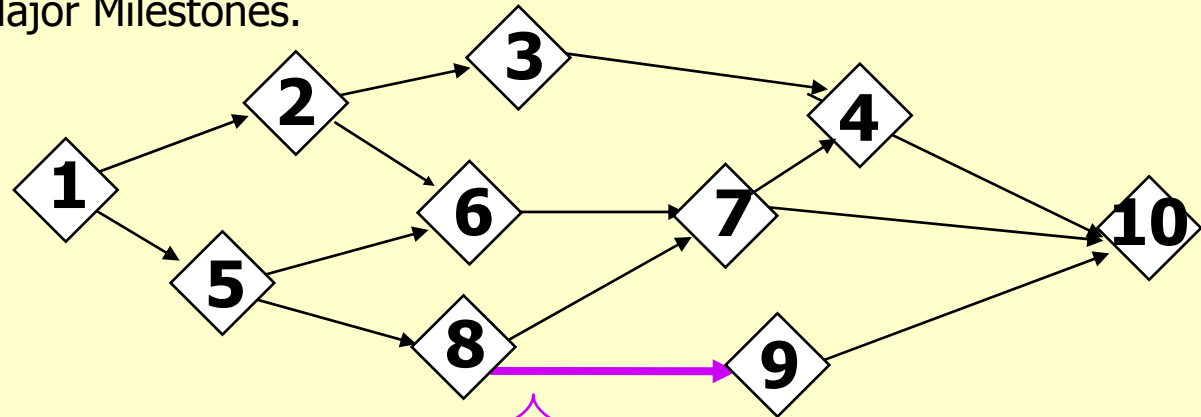
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Agenda

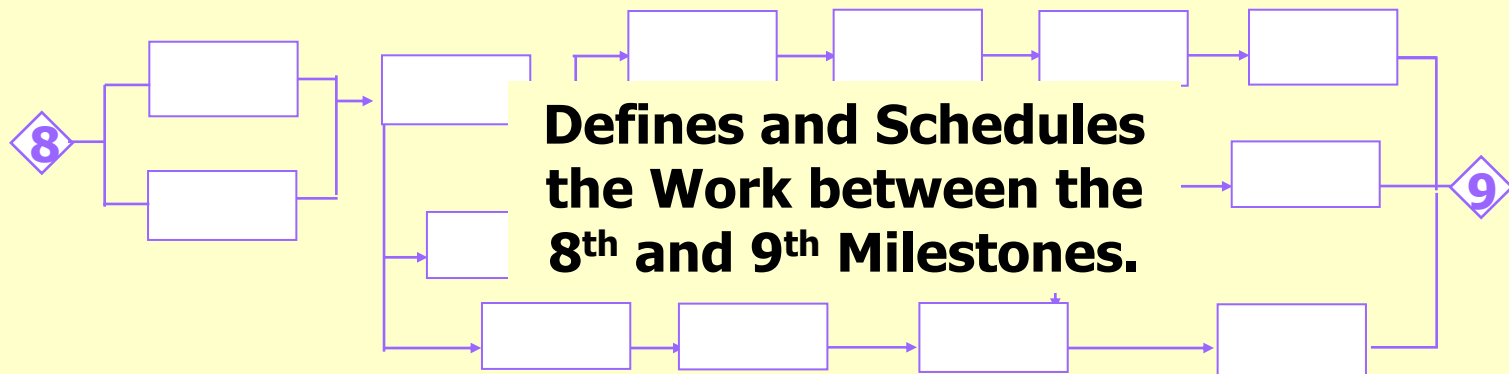
- Integrated Master Schedule (IMS)
 - Schedule Methodology from ADM to PDM
 - Date Calculation
 - Forecast and Impact
 - Linking
 - Intra-Program Interface and Dependency
- Integrated Master Plan (IMP)
 - Narrative with Embedded Table
 - Organized to Collect Metrics across Physical, Functional, and Business Lines
 - Relating to APB, Contract, Schedule, Cost
 - Relationship to IMP
 - Inter-Program Interface and Dependency

Schedule Methodology Evolves

Pre-computer - the Arrow Diagram Method (ADM) was used to identify the duration expected between Major Milestones.



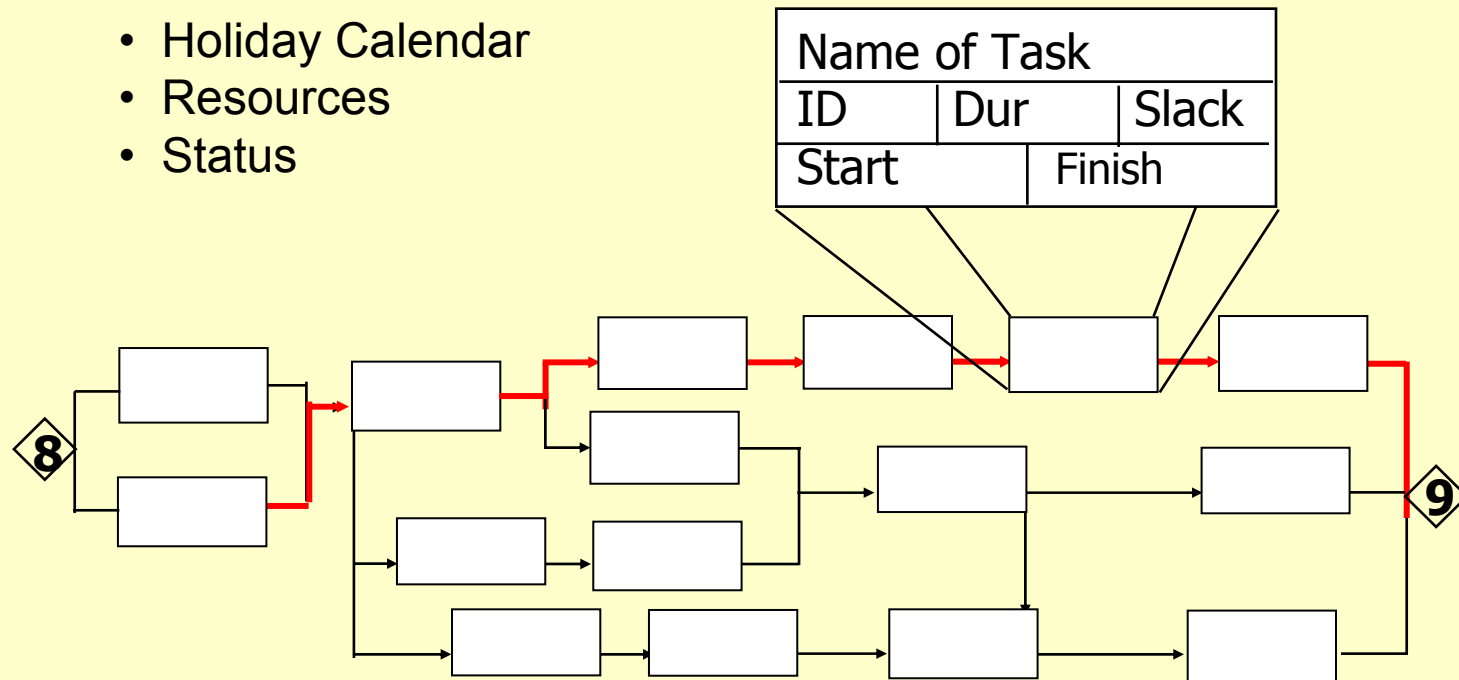
With computers - Schedules Evolved to include the Detailed Tasks to complete the Scope of Work. The Precedence Diagram Method (PDM) enables a accurate data collection for Performance Measurement, Earned Value, and accurate date forecast.



Basic Components

Calculation of Scheduled and Forecast Dates:

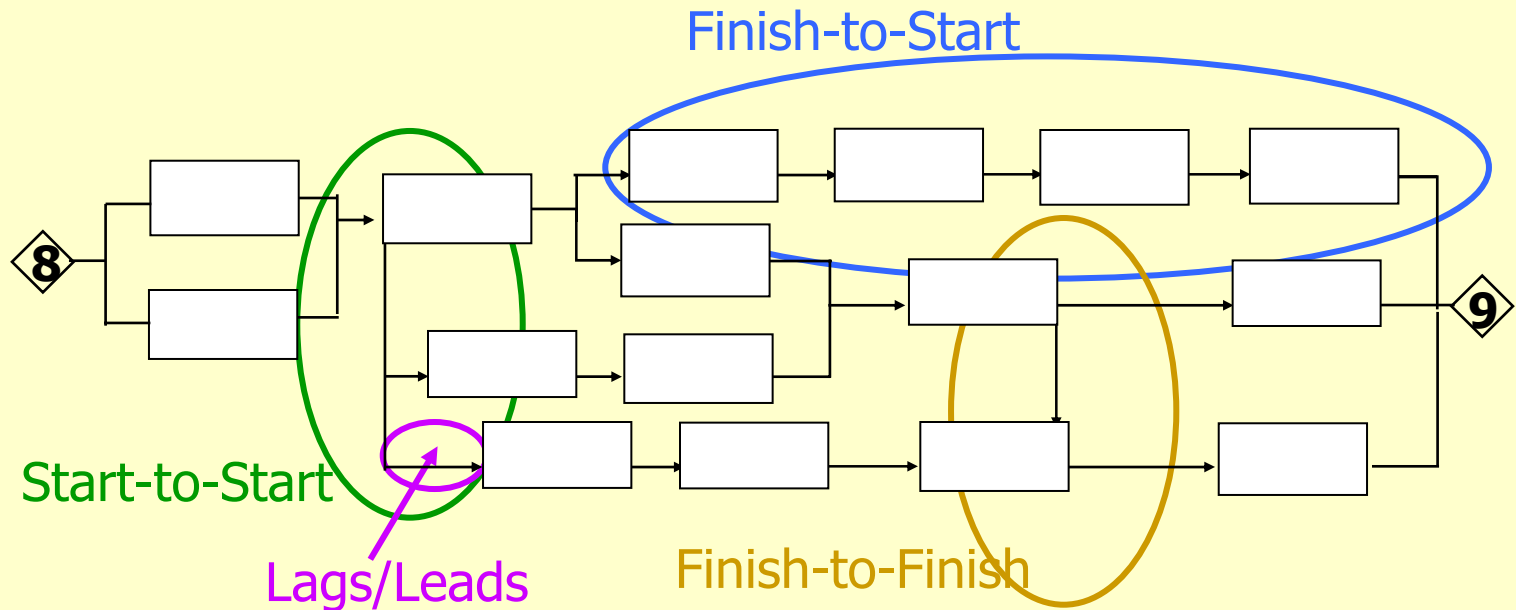
- Duration
- Precedence Sequencing (logic relationships)
- Lags / Leads
- Constraints
- Holiday Calendar
- Resources
- Status



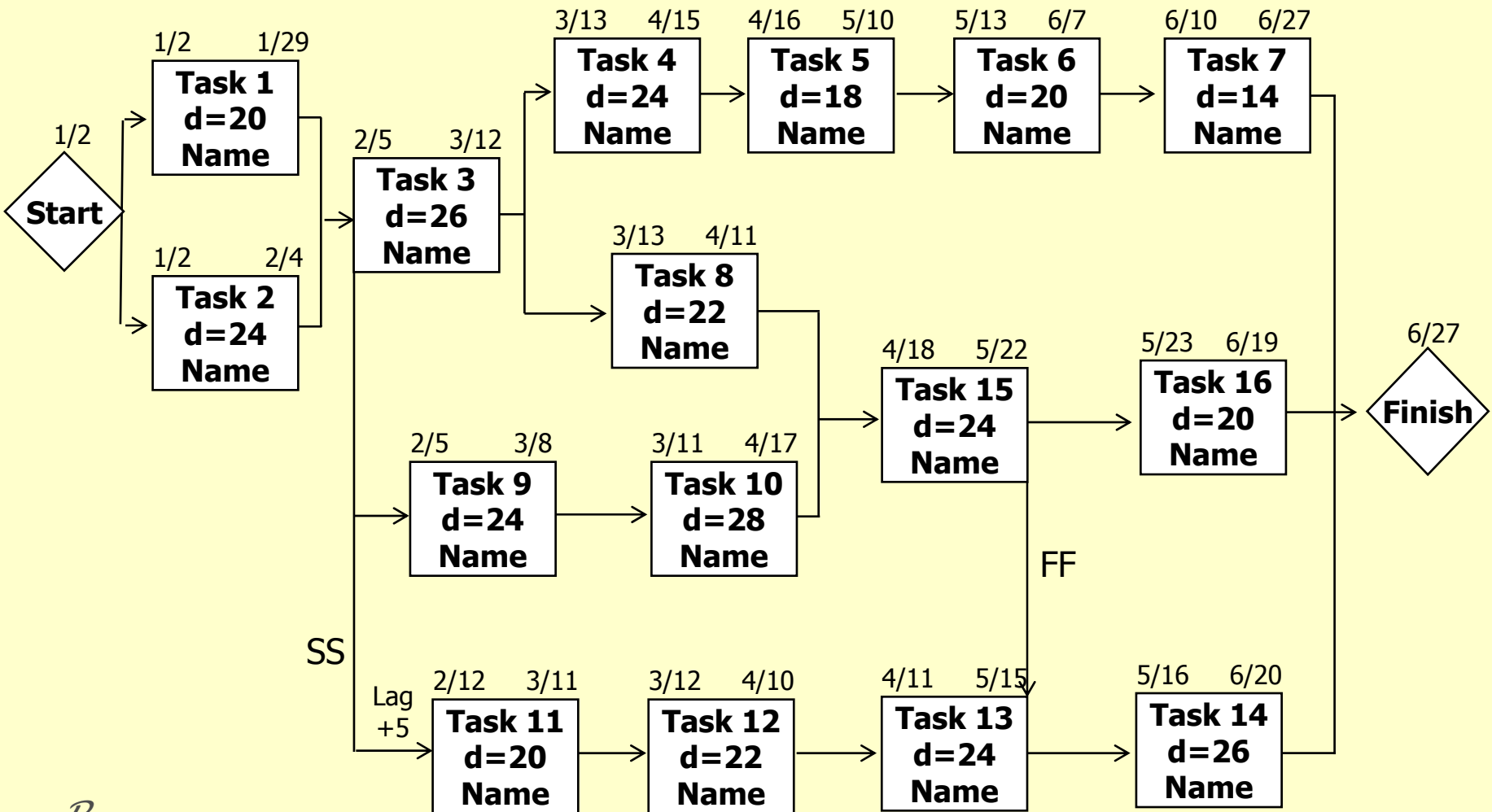
Three Data Points

Calculation of Scheduled Process:

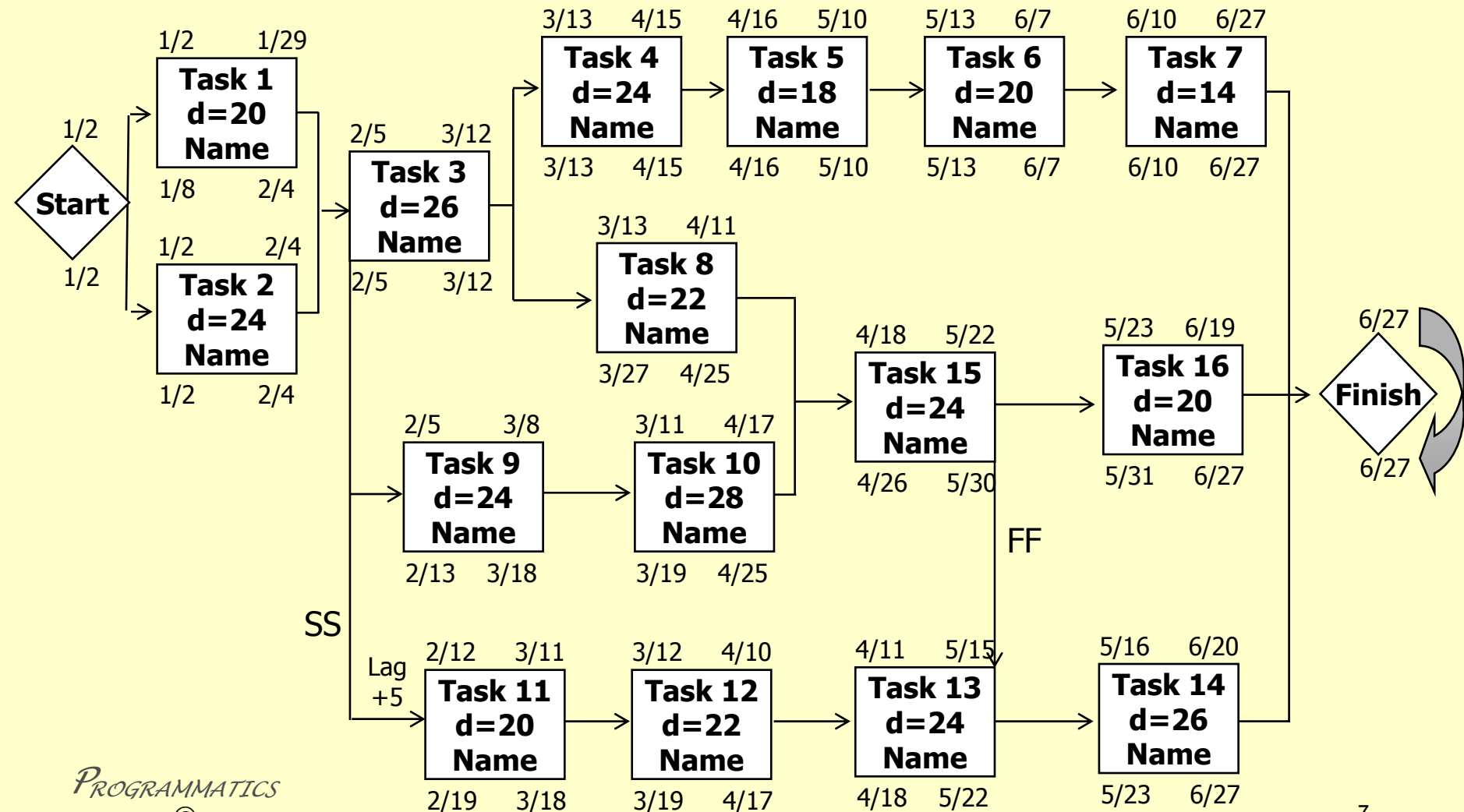
- Earliest Possible Dates “Forward Pass”
- Latest Possible Dates “Backward Pass”
- Delta Identification “Total Slack”



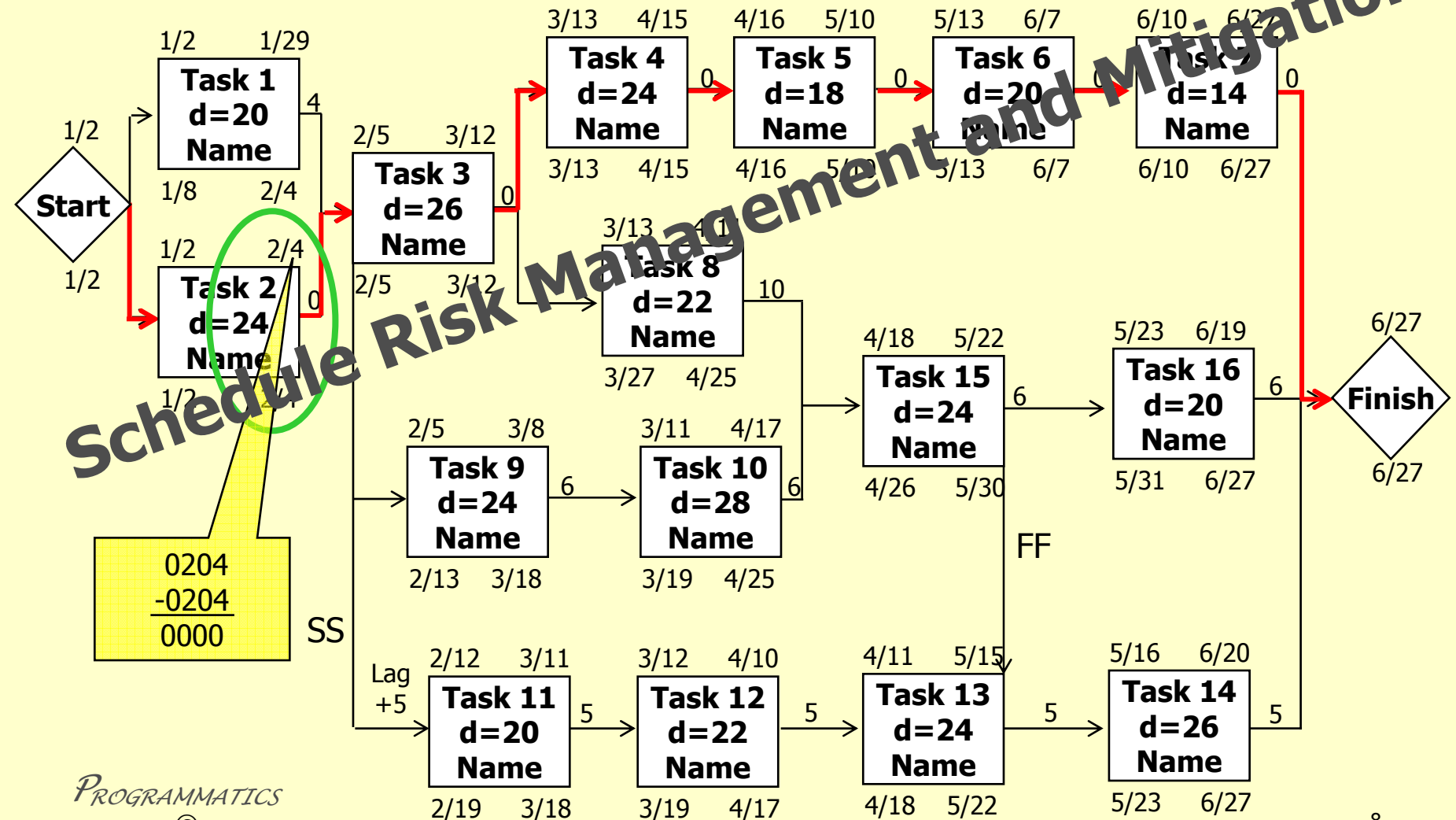
1. Forward Pass - *Early Dates*
2. Backward Pass - *Late Dates*
3. Total Slack and *Critical Path*



1. Forward Pass - *Early Dates*
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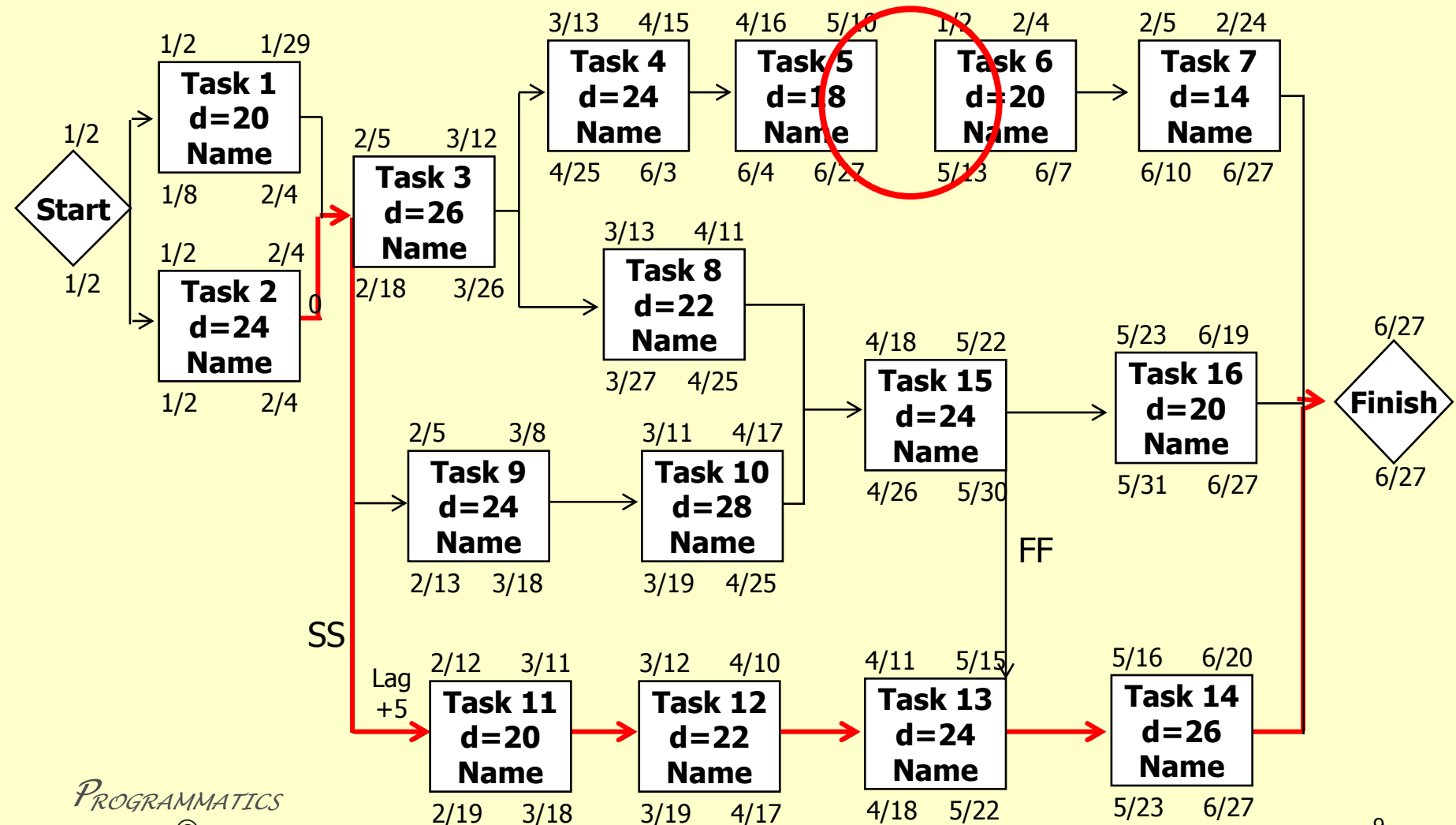


1. Forward Pass - *Early Dates*
2. Backward Pass - *Late Dates*
3. Total Slack and *Critical Path*



Effects of Broken Link

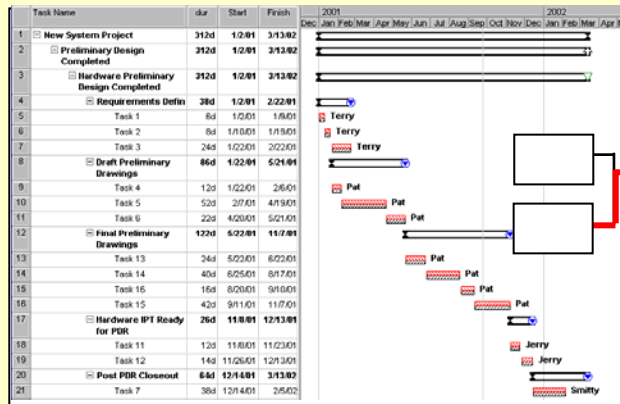
Forward Pass, Backward Pass, Total Slack, Critical Path



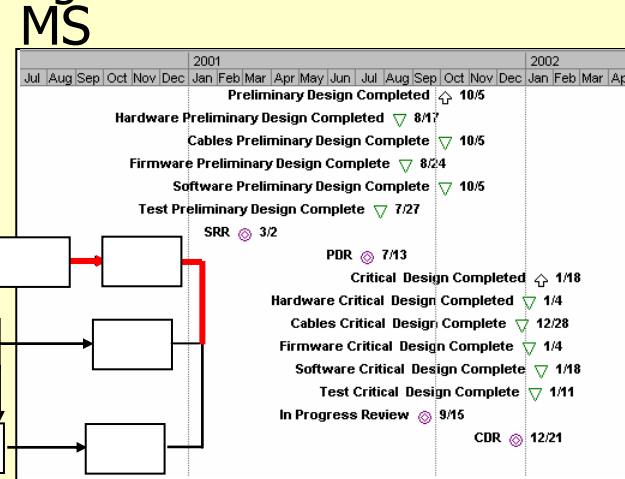
Optimize IMS Requirements

The IMP/IMS can be assigned unlimited views to facilitate any level of review from the Tasker, CAM, PM, Customer, Agency, Congress.

Gantt



Network Diagram



The Integrated Master Schedule file shall support all Program Events, Significant Accomplishments, and Accomplishment Criteria with detailed tasks, activities, and milestones with dependencies such that it calculates an accurate critical path. That file shall be submitted monthly in a Microsoft Project compatible format. The proposed IMS file shall be provided electronically... as an attachment.

Agenda

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Integrated Master Plan

IMP is a narrative describing

- Organizational Structure
- Program Management
- Management Methodology
- Personnel
- Security
- IMP Table
 - Program Events
 - Significant Accomplishments
 - Accomplishment Criteria

Embedded IMP Table

LI	PE	SA	AC	Task Description
1				New Product Project
2	01			Product Design Completed
3	01	01		Sys IPT - System Requirements Defined
4	01	01	01	Requirements Reviewed
8	01	01	02	Specifications Reviewed
12	01	01	03	Checked for Compliance
17	01	01	04	Sys IPT Ready for SRR
20	01	01	05	Sys IPT Post SRR Closeout
26	01	02		Sys IPT - Preliminary Drawings Completed
27	01	02	01	SRR Incorporation
31	01	02	02	Draft Preliminary Drawings Completed
35	01	02	03	Final Preliminary Drawings Completed
40	01	02	04	Sys IPT Ready for PDR
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53	01	03	04	Sys IPT Ready for CDR
55	01	03	05	Sys IPT Post CDR Closeout
59	01	04		SW IPT - Software Requirements
60	01	04	01	Critical Flow Diagrams Completed

- Summarizes Plan
- Ties to SOW, WBS, CPR and APB
- Basis for IMS
- Configuration Controlled
- Not time-phased

IMP to IMS Relationship

IMP Table

LI	PE	SA	AC	Task Description
1				New Product Project
2	01			Product Design Completed
3	01	01		Sys IPT - System Requirements Defined
4	01	01	01	Requirements Reviewed
8	01	01	02	Specifications Reviewed
12	01	01	03	Checked for Compliance
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60	01	04	01	Critical Flow Diagrams Completed

12	01	01	03
13	01	01	03
14	01	01	03
15	01	01	03
16	01	01	03

Detailing with tasks, activities, and milestones; time-phasing with durations, dependencies and sequencing relationships creates the IMS

Integrated Master Schedule (IMS)

Task Description	Dur	2001
		Jan Feb Mar Apr May
New Product Project	680d	
Product Design Completed	249d	
Sys IPT - System Requirements Defined	74d	
Requirements Reviewed	39d	
Task 1	10d	Terry
Task 2	15d	Terry
Task 3	24d	Terry
Specifications Reviewed	40d	
Task 4	10d	Pat
Task 5	20d	Pat
Task 6	10d	Pat
Checked for Compliance	27d	
Task 13	5d	Pat
Task 14	15d	Pat
Task 16	10d	Pat
Task 15	2d	Pat

Program Events (PE) are Critical

Summarizes Program at Tier One

- ↑ Definable
- ↑ At least Annually
- ↑ Can be Identified in the RFP
- ↑ Target Dates and Fee
- ↑ As Major Milestones for Inter-Program Interface and Dependency

Significant Accomplishments (SA)

Summarizes the Statement of Work at Tier Two

▼ Multiple Accomplishments for each Event

▼ Demonstrates Understanding of

- Government Needs and Concerns
- SOW
- Acquisition Life Cycle
- Technical Challenges

▼ Evolves the Plan

▼ WBS Pure

▼ Can be Control Account

▼ Included in Intermediate
Schedule

LI	PE	SA	AC	Task Description	Dur
1				New Product Project	680d
2	01			Product Design Completed	249d
3	01	01		Sys IPT - System Requirements Defined	74d
26	01	02		Sys IPT - Preliminary Drawings Completed	136d
49	01	03		Sys IPT- Critical Drawings Completed	75d
59	01	04		SW IPT - Software Requirements	50d
64	01	05		SW IPT- Software Desktop Solutions	125d
70	01	06		SW IPT- PDR Presentation	105d
76	01	07		SW IPT- Build Organization	75d
82	01	08		Deployment IPT - Logistics	65d
88	01	09		Deployment - Fielding & Training	208d
94	01	10		Test IPT - From the TEMP	249d
100	02			System Test	500d
101	03			System Demonstrated	180d
102	04			System Delivered	175d

Accomplishment Criteria (AC)

Defines exit criteria for each Accomplishment and provides a checklist

- ④ Evolves the Plan
- ④ Summarizes at Tier Three
- ④ Objective Fee Calculation
- ④ Can be Work Package
- ④ Included in Detail Schedule

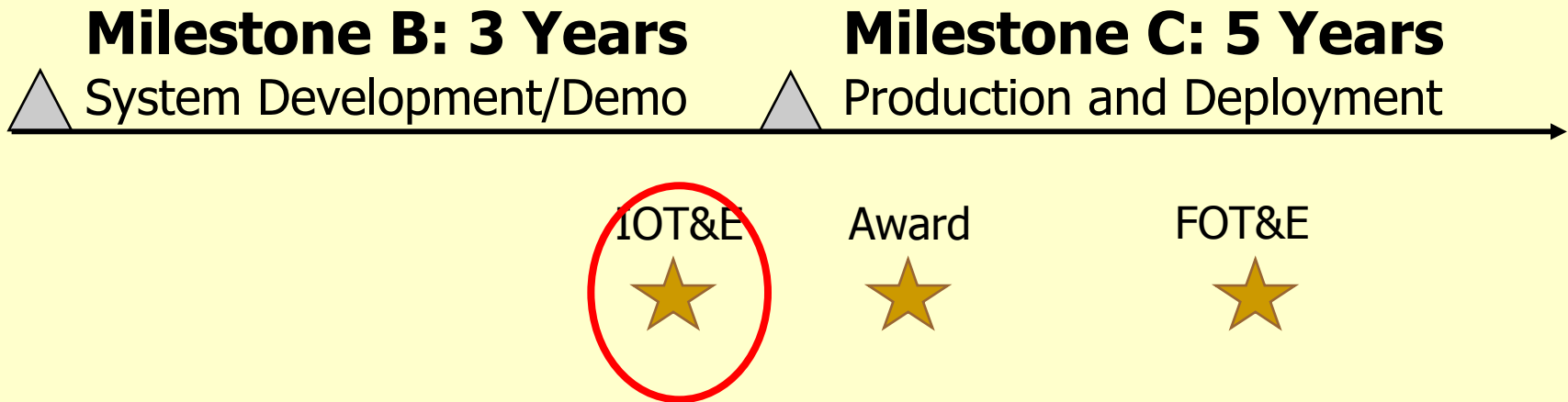
LI	PE	SA	AC	Task Description
1				New Product Project
2	01			Product Design Completed
3	01	01		✓ Sys IPT - System Requirements Defined
4	01	01	01	✓ Requirements Reviewed
8	01	01	02	✓ Specifications Reviewed
12	01	01	03	✓ Checked for Compliance
17	01	01	04	✓ Sys IPT Ready for SRR
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PE 01
WBS

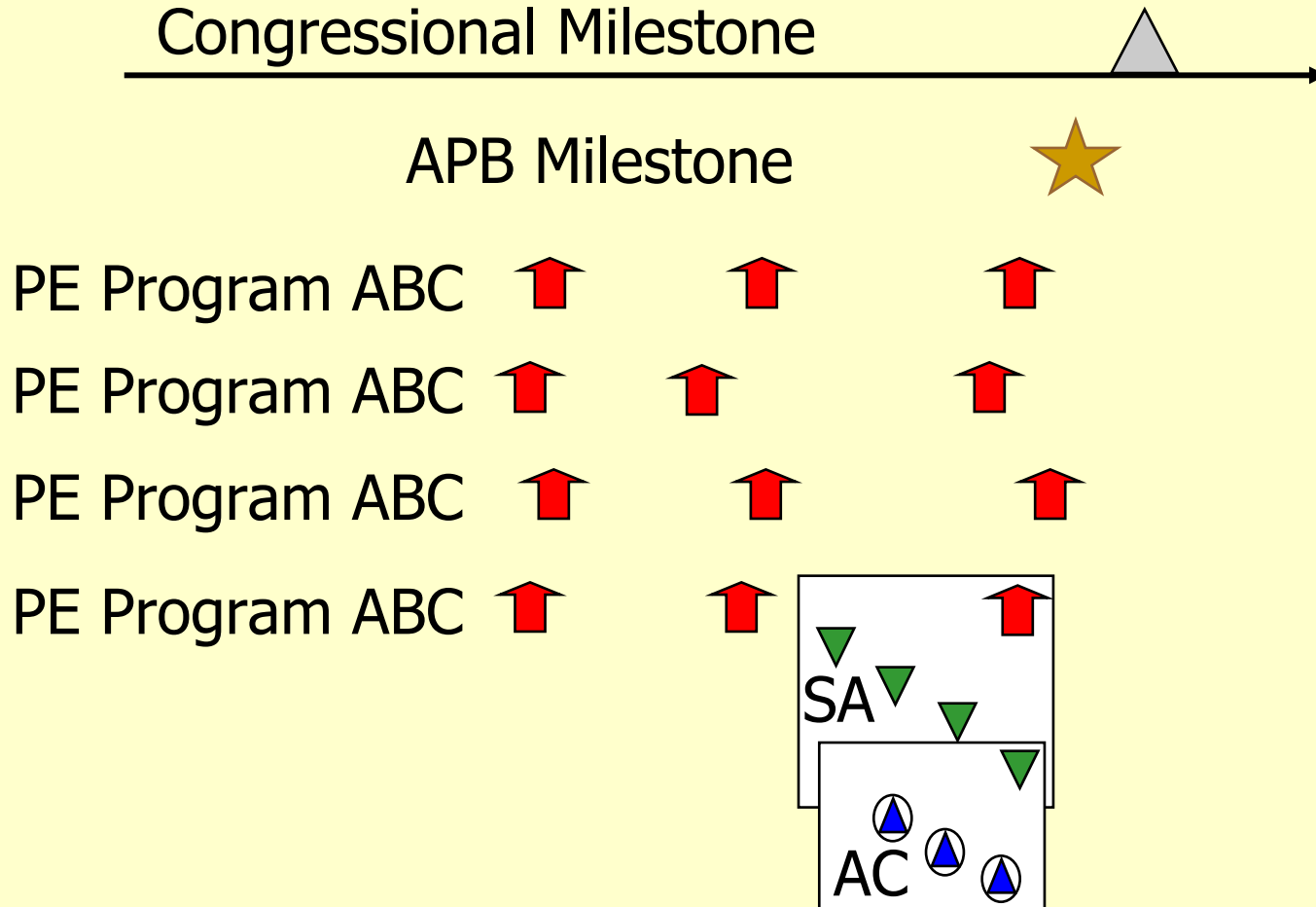


Acquisition Program Baseline

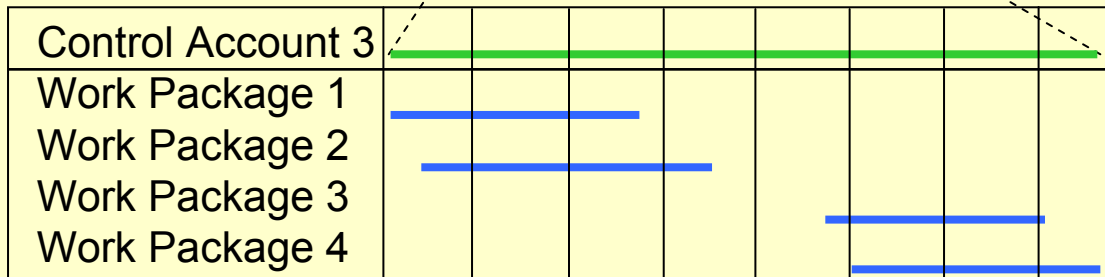
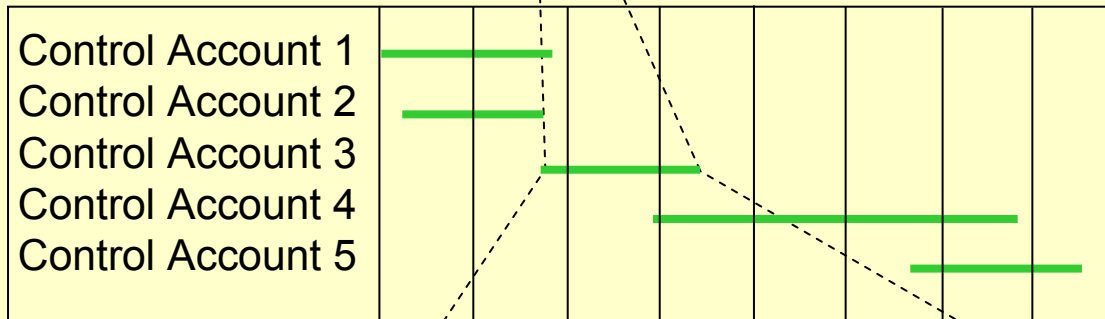
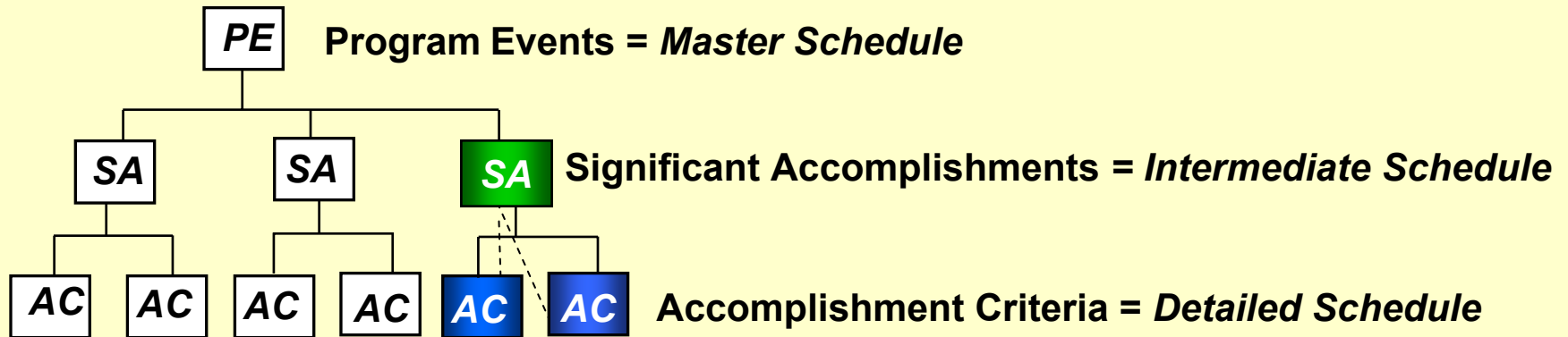
Acquisition Program Baseline (APB) is established prior to Milestone B and documents the strategy throughout the life cycle of the acquisition.



Roll-Up Hierarchy



IMP Vertical Traceability

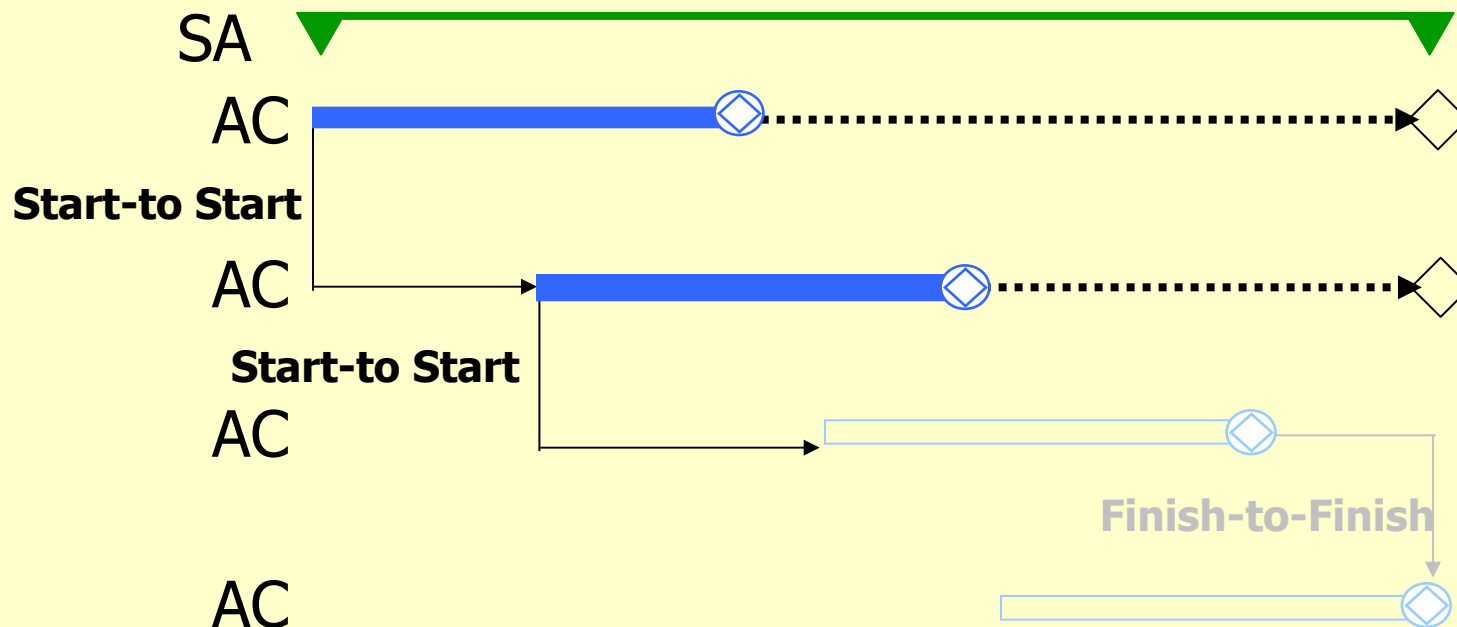


While Control Account and Work Package levels are determined by the bidder, the system lends itself to this format.

A summarizing of the time-phased schedule creates Master and Intermediate level schedules in direct correlation to the IMP.

Linking at the AC Level

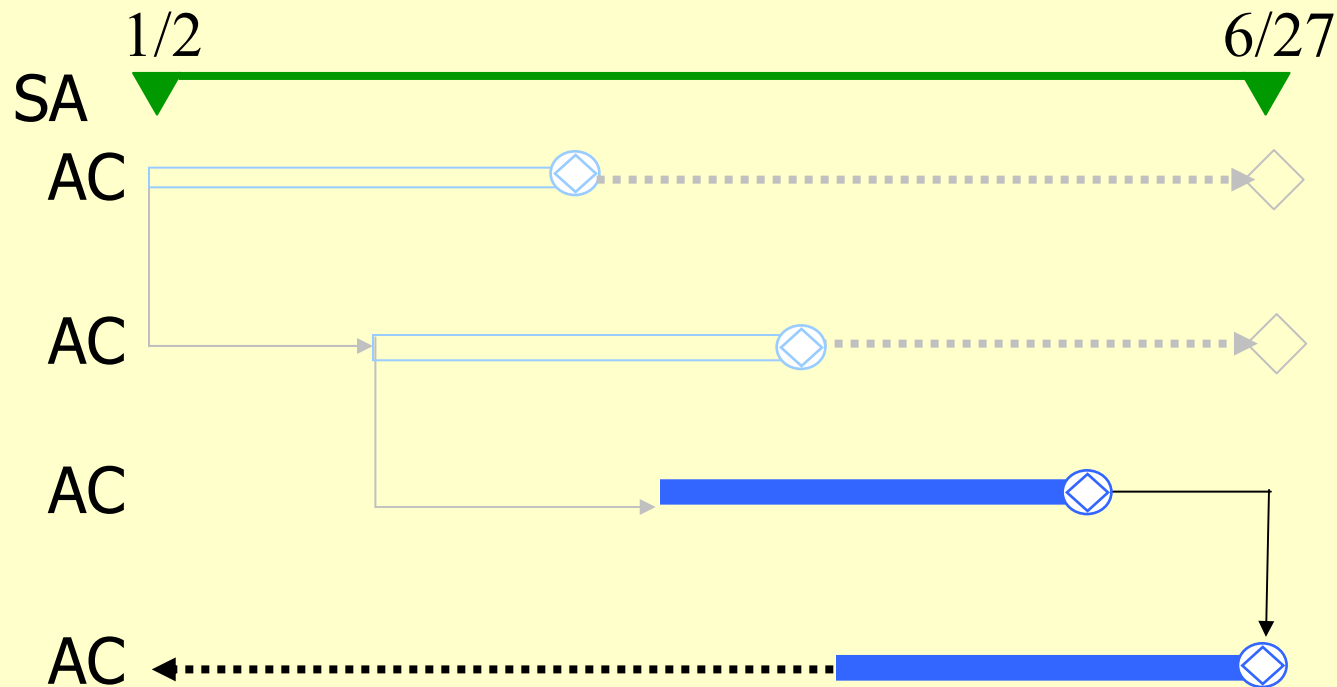
ACs are typically several months in duration. Because of extended duration and an overlapping nature, linking is by means of Start-to-Start or Finish-to-Finish relationships.



If the first task must start before the successor task can start, according to logic, when can it finish?

Calculation of Critical Path

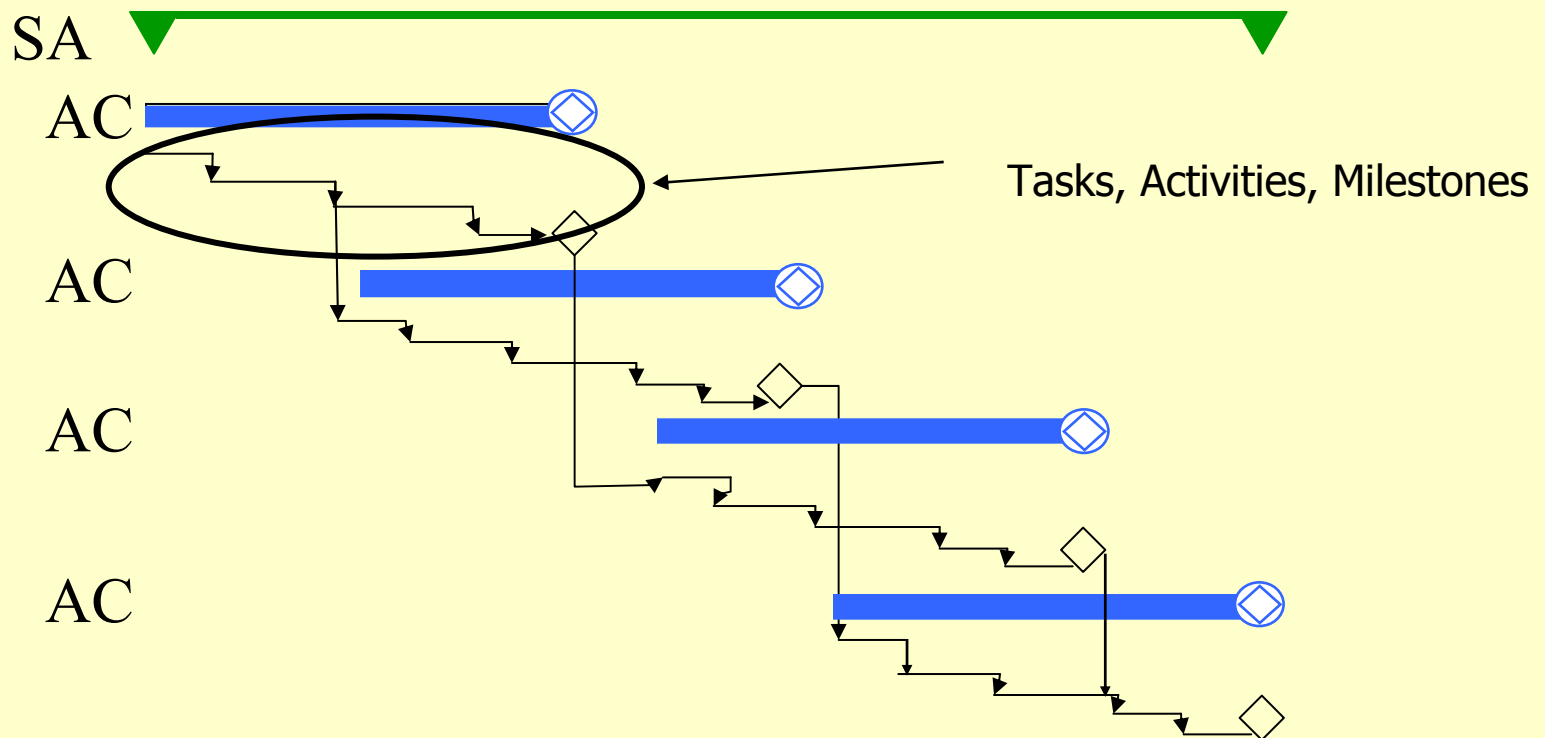
If a predecessor task must finish before the successor task can finish, according to logic, when can the successor task start?



When comparing the earliest possible start to the latest possible start for the calculation of Total Slack, can Critical Path be accurately determined?

Accurate Calculation at Task Level

A well defined logic network will have at least 80% Finish-to-Start relationships. This data allows manager to see the impact of slips as far down range as the schedule is developed to allowing for recovery and schedule risk mitigation.



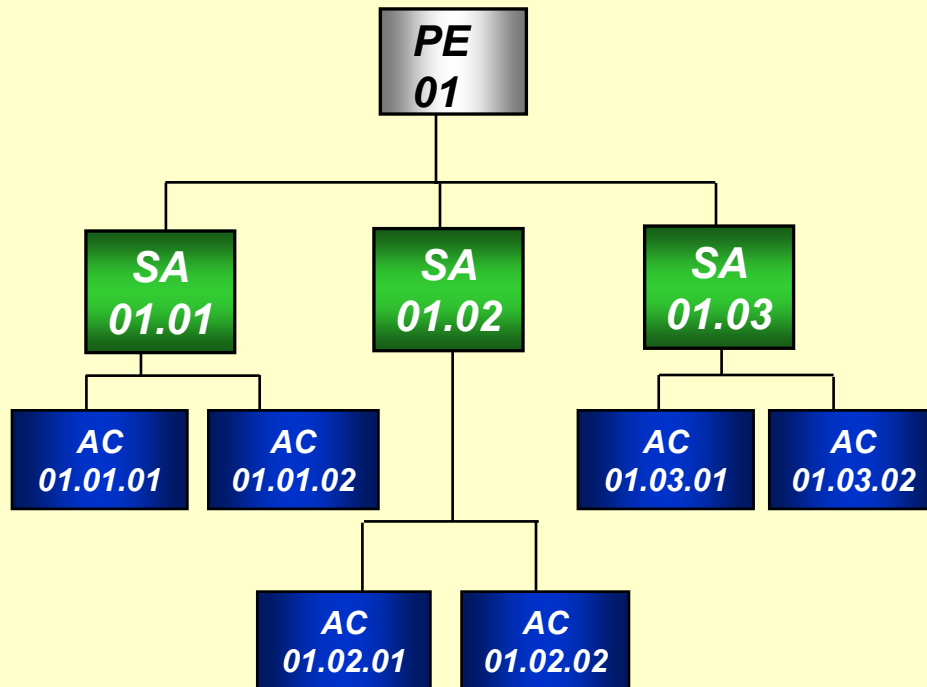
Mapping the Way Ahead

IMP/IMS aids Management at all levels.

- Project
 - Direction and Focus
 - Forecast Dates
 - Establish Cost
 - Report Progress
- Program
 - APB Milestones
 - Measure Performance
 - Programmatics
- System
 - Inter-program dependencies
 - System Level Testing

IMP Horizontal Traceability

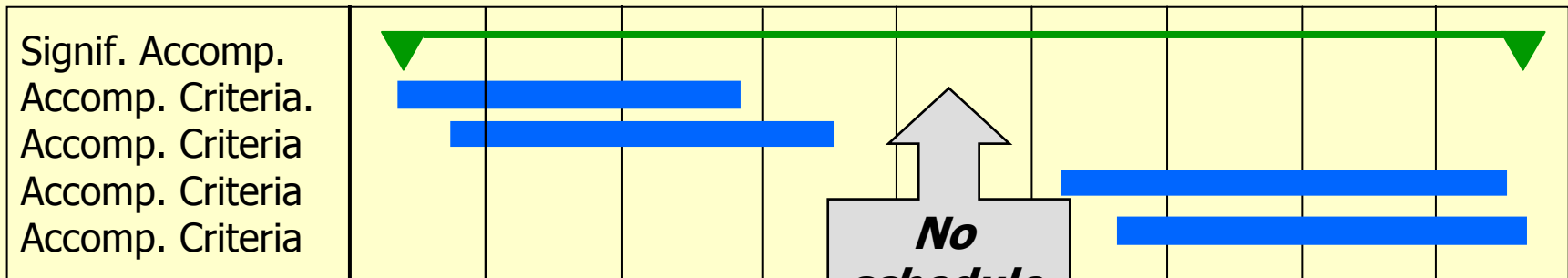
Sequential numbering creates a Work Breakdown Structure (WBS) and unique identification.



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IMS to Cost Relationship

Gantt view of time-phased activities for each reporting element will show need for resources allocation.



Resourced in Hours per Month per Laborer
dollarized with corporate rates.

These hours are then

Control Account 1	320	640	560	240		320	640	640	240
Work Package 1	240	320	240						
Work Package 2	80	320	320	240	0				
Work Package 3	0	0	0	0	0	240	320	320	200
Work Package 4	0	0	0	0	0	80	320	320	40
Engineer	140	240	160	60	0	60	160	160	80
Technician	140	240	240	60	0	100	320	320	120
Admin	40	160	160	120	0	160	160	160	40

*Expressed in \$K, the result is the **BCWS**.*

Measuring Performance

To Complete

Performance Index (TCPI)

Estimate To Complete (ETC) *Cost Variance (CV)*

Schedule Variance (SV) *Variance At Complete (VAC)*

Schedule Variance % *Estimate At Complete (EAC)*

Cost Efficiency *Cost Variance %*

Percent Spent *Schedule Efficiency*

Percent Complete

BCWS
BCWP
ACWP

Conclusion

Prior Planning Prevents Poor Performance

IMP/IMS is the foundation of a project's profitability

If you can't measure it, you can't manage it.

David Walker, Comptroller General